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EXAMINER

CHEN, SHIH CHAO

ART UNIT PAPER NUMBER

2821

DATE MAILED: 01/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/029,234

Applicant(s)

ELLIS ET AL.

Examiner

Shih-Chao Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-21, 36 and 37 is/are allowed.
- 6) ☐ Claim(s) 1-5, 7, 9-13, 15-18, 22-35, 38 and 39 is/are rejected.
- 7) ☒ Claim(s) 6, 8 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the power amplifier in claims 3-5, 16-17, 22, 25-27, 34-35 and 39 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 60 and 600. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

3. Claim 3 is objected to because of the following informalities: "The PIFA of claim 1" should be changed to --The PIFA of claim 2--. Appropriate correction is required.

4. Claim 39 is objected to because of the following informalities: "An offset top loaded monopole" should be changed to --an offset top loaded monopole--. Appropriate correction is required.

5. Applicant is advised that should claims 25 and 27 be found allowable, claims 34 and 35 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

6. Applicant is advised that should claim 3 be found allowable, claim 16 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 4-5, 7, 9, 15, 22-23, 26-28, 33 and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Saito (U.S. Patent No. 6,255,994).

Regarding claim 1, Saito teaches in figures 4-10 a planar inverted-F antenna (PIFA) [1] comprising: a top plate [2], a ground plane [3], a dielectric material [14, air] between the top plate [2] and the ground plane [3], and a feed pin [4] connected to the top plate [2]; a first shorting pin [5] and a second shorting pin [6], the first and second shorting pins [5, 6] connecting the top plate [2] to the ground plane [3] and being located at distances  $p_1 [L_c]$  and  $p_2 [L_d + L_c]$ , respectively, from the feed pin [4] to provide a desired impedance of the PIFA [1] at the feed pin [4].

Regarding claim 4, Saito teaches in figures 4-10 the PIFA whereby a power amplifier [12] (See col. 8, lines 38-42) is connected to the feed pin [4].

Regarding claim 5, Saito teaches in figures 4-10 the PIFR wherein the power amplifier [12] is a broadband power amplifier.

Regarding claim 7, Saito teaches in figures 4-10 the PIFA wherein the top plate [2] is rectangular (See FIG. 4).

Regarding claim 9, Saito teaches in figures 4-10 the PIFA wherein the dielectric material is air.

Regarding claim 15, Saito teaches in figures 4-10 the PIFA tuned at an operating frequency  $f_0$  and providing an inverse class-F load impedance.

Regarding claim 22, Saito teaches in figures 4-10 a communication device comprising: a planar inverted-F antenna (PIFA) [1] having a top plate [2], a ground plane [3], and a feed pin [4] connected to the top plate [2], a first shorting pin [5] and a second shorting pin [6], the first and second shorting pins [5, 6] connecting the top plate [2] to the ground plane [3]; a power amplifier [12] (See col. 8, lines 38-42); and a

transmission line (i.e. between the feeding terminal and the receiver circuit) connecting the feed pin [4] to the power amplifier [12].

Regarding claim 23, Saito teaches in figures 4-10 an offset top loaded monopole (TLM) comprising: a top plate [2], a ground plane [3], a dielectric material [14, air] between the top plate [2] and the ground plane [3] and a feed pin [4] connected to the top plate [2] substantially offset from the centre of the top plate to provide a desired impedance of the offset TLM at the feed pin [4].

Regarding claim 26, Saito teaches in figures 4-10 the offset TLM wherein a power amplifier [12] is connected to the feed pin [4]

Regarding claim 27, Saito teaches in figures 4-10 the offset TLM wherein the power amplifier [12] is a broadband power amplifier.

Regarding claim 28, Saito teaches in figures 4-10 the offset TLM wherein the dielectric material is air.

Regarding claim 33, Saito teaches in figures 4-10 the offset TLM tuned at an operating frequency  $f_0$  and providing an inverse class-F load impedance.

Regarding claim 39, Saito teaches in figures 4-10 a communication device comprising: an offset top loaded monopole [1] having a top plate [2], a ground plane [3], and a feed pin [4] connected to the top plate [2]; a power amplifier [12]; and a

transmission line (i.e. between the feeding terminal and the receiver circuit) connecting the feed pin [4] to the power amplifier [12].

9. Claims 1, 10, 23, 29 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by Saito (U.S. Patent No. 6,255,994).

Regarding claim 1, Saito teaches in figure 11 a planar inverted-F antenna (PIFA) [1A] comprising: a top plate [2A], a ground plane [3A], a dielectric material [14A] between the top plate [2A] and the ground plane [3A], and a feed pin [4A] connected to the top plate [2A]; a first shorting pin [5A] and a second shorting pin [6A], the first and second shorting pins [5A, 6A] connecting the top plate [2A] to the ground plane [3A] and being located at distances  $p_1$  [ $L_{c1}$ ] and  $p_2$  [ $L_{d1} + L_{c1}$ ], respectively, from the feed pin [4A] to provide a desired impedance of the PIFA [1A] at the feed pin [4A].

Regarding claim 23, Saito teaches in figure 11 an offset top loaded monopole (TLM) comprising: a top plate [2A], a ground plane [3A], a dielectric material [14A] between the top plate [2A] and the ground plane [3A] and a feed pin [4A] connected to the top plate [2A] substantially offset from the centre of the top plate to provide a desired impedance of the offset TLM [1A] at the feed pin [4A].

Regarding claims 10 and 29, Saito teaches in figure 11 the planar inverted-F antenna (PIFA) [1A] wherein the dielectric material [14A] is epoxy/glass (See col. 14, lines 50-52).

Regarding claim 38, Saito teaches in figure 11 an offset top loaded monopole (TLM) comprising of: a rectangular top-plate [2A], having a dimension L [ $La1$ ] and a dimension W [ $Lb1$ ], a ground plane [3A] having dimensions larger than those of the

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top-plate [2A], and a dielectric material [14A] sandwiched between the top-plate [2A] and ground plane [3A]; a feed pin [4A] connected to the top-plate [2A] somewhere within the top-plate's interior area of the top-plate; a length of transmission line (i.e. between the feeding terminal and the receiver circuit) connected to the end of the feed pin [4A] that is not connected to the top-plate [2A].

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2-3 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (Cited above) in view of Papatheodorou (U.S. Patent No. 6,072,434).

Saito teaches every feature of the claimed invention except for the transmission line being used for fine-tuning of the PIFA or TLM.

Papatheodorou teaches in figure 1 the transmission line [18] being used for fine-tuning of the PIFA or TLM [10].

Since one of ordinary skill in the art would have recognized the benefit of various alterations and modifications in order to use a transmission line or a coaxial line provides the tuning of the antenna feed (See col. 2, lines 3-5), it would have been obvious to provide Saito with the transmission line being used for fine-tuning of the PIFA or TLM as taught by Papatheodorou.



12. Claims 11-13 and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (Cited above).

Saito disclose the claimed invention except for the dielectric material is alumina or quartz or polytetra fluoroethylene. It would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the dielectric material is air or epoxy/glass, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. ***In re Stevens*, 101 USPQ 284 (CCPA 1954).**

***Allowable Subject Matter***

13. Claims 18-21, and 36-37 are allowed.

14. Claims 6, 8 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not disclose or fairly suggest the PIFA wherein  $p_1$  and  $p_2$  are equal as required by claim 6.

The prior art does not disclose or fairly suggest the feed pin and the two shorting pins form a right angle as required by claims 8 and 21.

The prior art does not disclose or fairly suggest the planar inverted-F antenna tuned at an operating frequency  $f_0$  and providing a class-F load impedance as required by claim 14.

The prior art does not disclose or fairly suggest adjusting the length of the transmission line to fine tune the input impedance of the PIFA at  $f_0$  and to maintain the desired harmonic loading at the second and third harmonics of  $f_0$  as required by claims 18-19 and 36.

The prior art does not disclose or fairly suggest scaling the length of the top plate by a factor of  $(f_0 / f_1)^2$  as required by claims 20 and 37.

### ***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shih-Chao Chen whose telephone number is (703) 306-2721. The examiner can normally be reached on Monday-Friday from 7 AM to 4:30 PM, First Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on (703) 308-4856. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-5841 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

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*Shih-Chao Chen*  
Shih-Chao Chen  
Examiner  
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SXC  
January 8, 2003